

Claims

1. A method of making a socket on a pipe (1) made preferably of copper, steel or alloys of Cu, Ni and Fe, by a preferably multi-step or single-step expansion of the pipe end with a large jump in diameter, wherein an expansion tool (2) is axially introduced into the pipe end, **characterized in that** simultaneously with and/or subsequently to the introduction of the expansion tool (2) into the pipe end, the expanded region or the region to be expanded of the pipe end is entirely or partially upset by a force applied axially to the pipe end, while the outer diameter of the pipe end to be processed is limited by one or more shaping shoes (3) entirely or partially surrounding the pipe end.
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2. The method as defined in claim 1, **characterized in that** in case of a multi-step expansion of the pipe end, only the region of the pipe end to be expanded or the expanded region of the pipe end of largest diameter is upset.
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3. The method as defined in claim 1 or 2, **characterized in that** the region of the pipe end to be expanded or the expanded region of the pipe end is upset to such an extent that the wall thickness is increased in the upset portion up to the wall thickness of the rest of the pipe or at least up to the wall thickness of the previously expanded portion.
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4. The method as defined in claim 1, 2 or 3,
characterized in that the upset pipe ends are inwardly flanged for receiving sealing elements.

5 5. An apparatus for making a socket on a pipe end with a method as defined in the foregoing claims, comprising
- an expansion tool (2) which is axially introducible into the pipe end and which has one or more conical and cylindrical parts (5', 6', 7', 8') determining the subsequent inner diameter of the pipe end,
- one or more shaping shoes (3) having conical and cylindrical parts (5'', 6'', 7'', 8'') determining the subsequent outer diameter of the pipe end, and
- a substantially cylindrically structured upsetting device (4) whose smallest inner diameter corresponds, with the necessary play, to the maximum outer diameter of the expansion tool (2) and which has a substantially radially extending annular shoulder (10) that may be pressed axially against the end face of the pipe end during the upsetting step.

25 6. The apparatus as defined in claim 5, **characterized in that**, on its side oriented toward the pipe end, the expansion tool (2) has a cylindrical part (11) which adjoins the shoulder (10) and whose inner diameter determines the greatest diameter of that enlarged outer diameter of the cylindrical part (8) of the pipe end which is reached after the upsetting step.

7. The apparatus as defined in claim 6, **characterized in that** the inner diameter of the cylindrical part (11) corresponds to the maximum inner diameter of the shaping shoes (3).

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8. The apparatus as defined in claim 6 or 7, **characterized in that** the axial length of the cylindrical part (11) is greater than or equal to the length of that cylindrical part of the shaping shoes (3) which has the largest inner diameter.

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